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ABSTRACT

In 1990, a study was conducted to investigate the relationship between students' locus of control and the extent to which they participated in a voluntary exercise program. First-time participants in the "Shape Up" program offered at the Porterville College Fitness Center during the summer and fall semesters of 1990 were identified through the registrar's office. Subjects then completed the 30-item Rotter Internal-External Locus of Control questionnaire on-site. After the subjects participated at their own discretion in the exercise program for the entire term, their attendance records were statistically evaluated. A pilot study of nine attendees, completed during the summer session, provided preliminary results suggesting that there were differences in workout attendance between individuals who perceived their lives to be internally controlled and those who saw themselves as externally controlled. In the study conducted during the fall semester, 23 students participated. Findings of the study indicated that both female and male subjects who perceived themselves to be internally controlled obtained significantly higher attendance scores than those perceiving themselves as more externally controlled. The study concluded that although the locus of control construct served as a discriminative factor with respect to exercise adherence, it was only one aspect of a global motivational system. (JMC)

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EXERCISE ADHERENCE AND LOCUS OF CONTROL

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EXERCISE ADHERENCE AND LOCUS OF CONTROL

ABSTRACT

The purpose of this study was to assess the relationship between people's beliefs about and perception of the control they had, whether external or internal, over their lives and the extent to which they adhered to an exercise program in which they voluntarily chose to participate. It was hypothesized that individuals who viewed themselves as having internal control would exhibit greater adherence to an exercise program than those who viewed their lives as being externally controlled.

Students enrolling in the Porterville College Fitness Center for the Summer and Fall semesters of 1990 were identified by the registrar's office as being first-time participants in the physical education "Shape Up" program. Participants, after accepting the invitation to participate in a study of attitude and its impact on exercise adherence and compliance, were given a thirty item questionnaire, the Rotter Internal- External Locus of Control (1966), which was completed on-site. No other instructions or information about the study were given to the participants. The subjects participated at their discretion in the open laboratory "Shape Up" program for the entire term. Each subject's attendance record was reviewed at the end of the term and added to the data base for statistical evaluation.

The findings of this study indicated that subjects, men or women, who obtained low scores on the Locus of Control Scale, perceived themselves to be internally controlled obtained significantly different attendance scores from those scoring relatively high on the Locus of Control Scale, thus perceiving themselves as being more externally controlled.

These findings, though only suggestive, because of the relatively small sample investigated , provided additional support to the contention that has been posited by the general motivation construct of Locus of Control (Rotter, 1966). Individuals who perceive to have more control over their lives and the outcome of their actions would be more motivated to follow through with a program that they choose to engage in than those who believe their fate is controlled by others or by external forces.

The locus of control construct could serve as a discriminative factor among subjects with respect to exercise adherence. It is, however, only a part of a more global motivational system of the individual in general perception of self-regulation. When focusing on the more specific behaviors of health promotion and maintenance, of which exercise adherence is a very special case, more specific measures need to be developed and validated. Follow-up experiments are currently being designed by the authors to isolate more specific personality and/or motivational variables which would affect adherence more directly. Some of the issues to be studied have been elucidated on in Dishman (1988).

EXERCISE ADHERENCE AND LOCUS OF CONTROL

Adherence to exercise or any program of medical treatment and health maintenance has been of much concern to clinicians and other health care providers (Belisle et al, 1987; Omre and Binik, 1989). Individuals embarking on health promoting activities which are either recommended by their health care provider or self-initiated, are likely to discontinue their chosen activity before the desirable outcome has been achieved (Dishman, 1981). The purpose of this study was to assess the relationship between people's beliefs about and perception of the control they have, whether external or internal, over their lives and the extent to which they would adhere to an exercise program in which they voluntarily choose to participate. It was hypothesized that individuals who viewed themselves as having internal control could exhibit greater adherence to an exercise program than those who viewed their lives as being externally controlled.

PROCEDURE

The "Shape Up" program includes a well designed, executed and monitored exercise routine of fifteen weight machines interspaced with fifteen stationary exercise bicycles. The participants alternate from weight machine to exercise bicycle at 45 second intervals, paced by a trainer's tape-recorded voice command, for not less than 22 minutes per exercise session. Attendance and the duration of each visit were recorded, time/date stamped by the instructor or student aid, at the start and finish of each exercise session.

The exercise program was designed on an open laboratory formula which allowed the student access to the facility, at the students convenience between the hours of 6:00 am to 8:30 am or from 11:30 am to 1:00 pm or from 3:30 pm to 7:30 pm Monday through Friday. There were no limitations on the number of visits per day or per week and there were no restrictions placed upon the length of each stay. Students were encouraged to record a minimum of two (2) visits per week to receive credit for the class. No letter grades were given. The grading was based solely upon attendance resulting in a credit or no credit for the class. The attendance record for each student, which was accurately maintained, was tabulated to show number of sessions attended and the length of stay during each session.

At the beginning of the summer and fall semesters students identified as first-time participants by the registrar, were contacted in writing, asking them to participate in a study designed to explore exercise adherence. The number of students identified by the registrar was not as high as had been projected. Therefore, the total number of subjects, summer and fall were combined in an effort to increase the statistical significance of the study.

Participants, after accepting an invitation to participate, read and signed a consent to participate in a study of attitude and its impact on exercise adherence and compliance. The subjects were next given a thirty item questionnaire, the Rotter Internal- External Locus of Control (1966), which they completed on-site. No other instructions or information about the study were given to the participants. The subjects participated at their own discretion in the "Shape Up" program for the

entire term. Each subject's attendance record was reviewed at the end of the term and added to the data base for statistical evaluation.

RESULTS AND DISCUSSION

The Pilot Study

The pilot study, which was completed during the Summer Session provided initial information suggestion that the experimental questions posited for this study were valid. The preliminary results suggested that there were differences in work-out attendance between individuals who perceived their lives to be internally controlled and those who saw themselves as being externally controlled.

The data collected for all subjects during the Summer Session are presented in Table 1. These data include two groups, one signing up for the regular exercise program and another for the Adaptive Physical Education Program.

Table 1.
Basic Information Gathered From All Subjects Enrolled In The Summer Session, 1990.

a. Regular Exercise Program

Subject	Sex	Age	Marital Status	Yrs. of Education	Locus of Control	Attendance
1.	M	52	M	17+	8	22
2.	M	51	D	12	16	37
3.	M	52	M	11	0	18
4.	F	40	D	17+	6	13
5.	F	22	S	9	11	20
6.	F	46	M	8	13	7
7.	F	20	S	15	13	43
8.	F	36	M	12	7	31
9.	F	60	M	16	1	27

b. Adaptive Physical Education

Subject	Sex	Age	Marital Status	Years in School	Locus of Control	Attendance
1.	M	47	W	17+	4	18
2.	M	30	M	13	3	32
3.	F	51	M	12	7	46
4.	F	73	W	16	3	37
5.	F	63	M	16	3	36
6.	F	65	W	9	10	50

Inspection of the data obtained for individuals signing up for the Adaptive Program revealed relatively small variation for the locus of control scores (LC). Therefore, no further analysis was conducted using these data.

On the other hand, the locus of control scores for the subjects under the regular exercise program showed more substantial variation. Following the proposed method for comparison, the top and bottom quartiles of scores were identified. On the low end, this included subjects #'s 3 and 9 obtaining, respectively 0 and 1 points on the LC scale and the corresponding attendance (AT) scores of 18 and 27. On the high end, subjects #2, with attendance score 37 and subjects 6 and 7, both of whom obtained LC scores of 13 were identified. However, since two subjects obtained the second to the highest LC scores to be included in the high quartiles to be compared with the low quartile. The scores for these two equally ranking subjects were averaged to be used as a single score for AT comparison. The data for the lowest and highest quartiles were then averaged and entered into a simple chi-square test for independence. The contingency table below (Table 2) shows the data entered for that test.

Table 2.
Test of Independence of Attendance Scores for Highest and Lowest Quartiles of Locus of Control Scores for Pilot Study.

	Locus of Control	Attendance
Low Quartile (N=2)	.5	22.5
High Quartile (N=2)	14.5	31

The Chi-Square value obtained for these data was 7.87 which was significant at the .01 level of confidence (i.e., .01 level with df=1 is 6.64).

It should be reiterated that the means represented in the cells of this table are based essentially on only two observations and thus could only provide, at best, general suggestions as to possible differences among groups. The suggested direction of possible differences was that individuals who obtained low scores on the LC scale, that is, tended to show greater internal control, attended fewer exercise sessions than those obtaining high scores on the LC Scale (ie., expressing a tendency towards external control). Unfortunately, while a difference between people perceiving internal versus external control was suggested, it was in the reverse direction from what was initially hypothesized. However, regardless of the direction of the difference, the design of the study and the experimental questions posited merited further investigation and justified proceeding with the study as planned.

The Study Proper

Unfortunately, as indicated earlier, projected enrollment of first time participants in the Shape-Up program for the fall semester did not materialize. Of the total of 28 students enrolled in the program 5 had to be deleted from the study because they

either did not complete the questionnaire correctly or had to drop out of the program for reasons beyond their control. Therefore, only 23 students actually participated in the study. With the relatively small total number of subjects, Table 3 shows all the raw data of all items of information gathered for this study.

Table 3.
All Information Gathered From All Subjects Enrolled For The First-Time In The Fall 1991 Semester.

Subject	Sex	Age	Marital Status	Yrs. of Education	Locus of Control	Attendance
1.	M	17	S	13	10	22
2.	M	26	S	15	7	35
3.	M	58	D	5	6	29
4.	F	17	S	12	12	18
5.	F	32	M	14	6	7
6.	F	17	M	9	10	26
7.	F	20	S	14	7	29
8.	F	28	S	14	3	4
9.	F	32	M	16	12	32
10.	F	18	S	12	10	32
11.	F	41	D	12	10	6
12.	F	40	M	17	5	24
13.	F	20	S	13	10	9
14.	F	51	M	9	12	7
15.	F	24	M	16	9	25
16.	F	17	S	11	10	14
17.	F	19	S	12	17	43
18.	F	18	S	12	7	59
19.	F	17	S	12	9	34
20.	F	38	M	14	1	34
21.	F	39	M	17	11	2
22.	F	16	S	11	8	21
23.	F	17	S	11	9	21

Data analysis proceeded in the same manner as in the Pilot Study. With a total of 23 subjects, the lowest and highest quartiles comprised, after rounding-off, of 6 subjects in each group. However, as was the case in the pilot study, 6 subjects obtained a score of 10 on the LC Scale. Although two of these subjects could have been selected at random, it was decided to obtain the average AT score for the highest quartile. The resulting means of LC and AT scores were then entered in a contingency table to test them for independence, using the chi-square test. Table 4 shows the LC and AT means for highest and lowest quartiles employed in the test for independence.

Table 4.
Test of Independence of AT Scores for Highest and Lowest Quartiles of LC Scores For Study Proper.

	Locus of Control	Attendance
Low Quartile (N=6)	4.7	26
High Quartile (N=6)	12	20

The Chi Square value obtained for these data was 3.95, which is significant at the .05 level of confidence (i.e., .05 level of confidence with df=1 is 3.84)

These findings indicated that subjects, men or women, who obtained low scores on LC Scale, that is, perceived themselves to be internally controlled obtained significantly different AT scores from those scoring relatively high on the locus of control scale, thus perceiving themselves as being more externally controlled.

These findings, though only suggestive, because of the relatively small sample investigated in this study, provide additional support to the contention that has been posited by the general motivation construct of Locus of Control (Rotter, 1966). Individuals who perceive to have more control over their lives and the outcome of their actions would be more motivated to follow through with a program that they choose to engage in than those who believe that their fate is controlled by others or by external forces.

Other studies which investigated the relationship between locus of control and adherence to a health related program (Salzer, 1982) found that although this measure did not predict program completion, people with perceived internal control showed other improvement in the program over externally controlled subjects. Similar general findings were obtained by Wallston, et al (1976), whereby, internally controlled people improved more in a self directed weight loss program and were more satisfied with it than other subjects.

In conclusion, the locus of control construct could serve as a discriminative factor among subjects with respect to exercise adherence, it is only a part of a more global motivational system of the individual in general perception of self-regulation. When focusing on the more specific behaviors of health promotion and maintenance, of which exercise adherence is a very special case, more specific measures need to be developed and validated. Follow-up experiments are currently being designed by the authors to isolate more specific personality and/or motivational variables which would affect adherence more directly. Some of the issues to be studied have been elucidated on in Dishman (1988).

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